methods. No. 1, in which the mercury was in the proportion of 1:10000, showed at the end of ten days five colonies of the fungus. Nos. 2 and 3, in which the mercury was in the proportion of 1:6000 and 1:4500, respectively, failed to give any growth. Gelatine affords a good medium for the growth of this fungus, and one also can distribute the fungicide much more thoroughly than can be done in a permanently solid mixture. When grown on solid media a much larger proportion of the poison is necessary, as it is impossible to distribute it as thoroughly as in fluid cultures. A quantity of starch paste was made, to which was added corrosive sublimate, in exact proportion of 1:1000. This was done before boiling the starch solution, in order to distribute as thoroughly as possible the mercury. Of three cultures made from this starch paste, two at the end of six days showed considerable growth of the fungus, about the inoculation point. This seems to indicate that it is on account of the density of the medium, and consequent insufficient distribution of the poison, that the fungus is able to grow. When grown in proper media, in which the poison can be thoroughly and equally distributed, Penicillium is unable to stand the presence of germicides to a greater extent than many other forms.—H. L. RUSSELL, *Botanical Laboratory University of Wisconsin.*

CURRENT LITERATURE.

Hackel's Gramineae.

American literature has received an invaluable increase in the translation of a work so important as that of Prof. Hackel,[1] not only in regard to its scientific merits, but also as being of practical use to the farmers and students in the United States. Among all the works hitherto published upon this subject, Prof. Hackel's book ranks as undoubtedly the most comprehensive, and the translators have rendered a great help to the study of this family, the grasses, in our country.

We are therefore greatly indebted to the translators for having made such a work more accessible to American students and farmers, and the translation has been done in a manner that makes it not only pleasant reading, but also interesting to scientific students and easily understood in practical use.

The work, as it presents itself, is divided into two parts, of which the first contains general remarks upon the structure, morphology and physiology, while the second part includes keys of analysis and descriptions of the tribes and genera. We find, for instance, in the first part all the modern views in regard to the correct understanding of the structure of

[1] The True Grasses, by Edward Hackel, translated from Die natürlichen Pflanzenfamilien (Engler and Prantl) by F. Lamson-Scribner and Effie A. Southworth. (Henry Holt & Co., New York, 1890.)

the grass-flower, an explanation of the different organs, the glumes, the palet, the lodicles, etc.; furthermore the structure of the seed with the embryo, and a very complete description of the germination itself. This is so much more important, as the translators thereby have defined several botanical terms in a clear and concise manner, at least so that several of these are easily to be used also in descriptions of other families. The second part contains the more systematic treatment of the genera, preceded by a key to the tribes. Diagnoses have also been given to not less than 313 genera, which is an increase of fifteen genera over the number recorded by Bentham and Hooker. It is also a good improvement, made by the translators, that the respective number of each genus in Bentham and Hooker's Genera Plantarum has been inserted in parenthesis before the generic names, which facilitates ready reference to that work and at the same time shows the diversity between the systems of classification adopted.

It is also to be remarked, that a number of notes and observations have been added to the translation by Profs. Hackel and Scribner, so that it is even more complete than the original work. The book contains numerous good figures, most of which have been obtained from older authors, as for instance, Gray, Kunth, Nees v. Esenbeck, Trinius, and others.

But while an attempt has been made, as it seems successfully, in regard to the identification of the genera of the grasses in a more complete stage with the flowers developed, then the next stage should be to teach how to distinguish them before the blooming, by characters taken for instance from the leaves or rhizomes. Several attempts have already been made in this line by European botanists, and with great success, so that it has been proved that in many cases the leaf alone is sufficient, when the question is to distinguish a genus or even a species. This would be a great help to the farmers and field botanists, but at the same time of great interest to descriptive botany, in adding structural characters to the diagnoses.

It is far from difficult to find characters of this kind, if we look at the differences in the venation of the leaf, the form of the blade, the ligule, the sheath, whether open or closed, which show a large variation even in the same genus. And the internal structure of the leaf, examined by a low power of the microscope, will undoubtedly show many differences.—THEO. HOLM, *U. S. National Museum*.

A new school text-book.

Does the frequent appearance of new text-books show that there is still a want, "long felt," yet not "met"? or does it merely indicate that another live teacher has a plan of his own which he thinks others may find useful? Dr. Campbell's Structural and Systematic Botany[2] is offered

[2] CAMPBELL, DOUGLAS HOUGHTON.—Elements of Structural and Systematic Botany, for High Schools and elementary college courses. Pp. ix. 253. Ginn & Co., Boston, 1890.

now as "an introduction to the study of botany, for use in high schools especially, but sufficiently comprehensive to serve also as a beginning book in most colleges." It comes also as "a strong protest against the only too prevalent idea that the chief aim of botany is the ability to run down a plant by means of an 'analytical key,' the subject being exhausted as soon as the name of the plant is discovered." With which protest we are in complete sympathy. Fortunately we have begun to see the decay of this notion of the province of botany and its destruction from this time will be rapid.

We must doubt, however, whether it is not better for beginners to get a conception first as to the gross anatomy of the flowering plants. The only objection that can be urged against beginning in "the good old way" is that false notions of the relations of the flowering plants and their structures are likely to be obtained, which will be difficult to eradicate. Any teacher, however, who is capable of using the book before us will be capable of imparting correct notions of the phanerogams. Herein lies the chief difficulty as far as teaching botany is concerned—the trouble is not so much with the books as it is with the teachers. Few will be found except in the high schools of the largest cities who are competent to use the book now offered to them. If they are competent we fear that the time required for its completion will prove a bar. It must be conceded that this book can only be used by a teacher well-trained in general morphology and histology, and with command of at least a year of the pupil's time for two hours daily—conditions hardly to be expected in our high schools and too seldom attained in our colleges.

Moreover the book deals so much with classification that at times it almost degenerates into a catalogue of orders with their characters. If these parts are to be memorized they are too voluminous. If they are for reference only they are far too condensed. In general its plan is the same as that of Bessey's Essentials of Botany, lacking the introductory part of that and having a fuller account of individual representatives of some groups. (It may be mentioned here as curious that neither of Bessey's works is mentioned among the useful reference books.)

Although we do not coincide with the author as to the wisdom of his plan, it must be said that Dr. Campbell has had a clear and definite plan and has executed it well. The illustrations are nearly all new, well drawn, well engraved and suitable to the page. A few are too sketchy—so much so as to give a poor idea of the structure represented. The publisher's work is in every way excellent.